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NATURAL HISTORY NOTES ON SOME BEAUFORT,
N. C., FISHES, 1910-1911.

No. II. TELEOSTOMI.

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In the first paper of this series, printed on pages 141-156 of this volume, there were recorded the observations made during 1910 and 1911 on the Elasmobranchs of the region about Beaufort, N. C. The present paper deals with the teleost fishes and consists, like the first one, of notes on the personal observations of the writer together with data obtained from various other reliable sources.

Acknowledgment is gratefully made to Mr. Russell J. Coles and to the assistance received from Dr. Hugh M. Smith's "Fishes of North Carolina." The following notes, in many cases, only corroborate and extend the data presented so admirably by Dr. Smith.

Lepisosteus osseus (Linnaeus).

GAR-PIKE.

Two "shell gars" were taken by the writer during the summer of 1910, one of which was skinned. No measurements were made of the fresh fish, but the dried skin is 3 feet $5\frac{3}{4}$ inches long.

In seining at the Narrows during the latter part of May, 1911, the writer took no fewer than 10 gar pikes. The first of these, a female, was 42 inches long from tip of snout to tip of caudal fin, and $14\frac{1}{2}$ inches in circumference. Autopsy showed the ovary, the right lobe of which was $10\frac{1}{2}$, the left $11\frac{1}{2}$ inches long, to be crowded with bluish-green eggs. The stomach contained 2 partly decomposed fish about 8 inches long. In

* Both the gars referred in "Notes for 1909" died during the winter of 1909-10. No record, however, was made of either time or cause. They were in captivity in the laboratory for more than a year, and probably for more than 15 months.

skinning this fish it was found to be very fat, there being a large accumulation of this in what might be called the shoulder region.

On June 6, 9 specimens were taken in one haul of the seine at the Narrows at Rockfish Rock. These measured over all: 26 inches (3 specimens), 27½, 35, 37, 37½ (2 specimens), and 44½ inches. Strong pressure brought neither eggs nor sperm from these fish, it being probably too early in the season—which it will be remembered had been a very cold and backward one.

The largest of these gars (a male), which was the largest the writer has ever seen at Beaufort, was thrown into the bottom of the fishing skiff and brought 7 miles to the laboratory. Being put in a tank of salt water it soon recovered and became quite normal. On the next day the water was drawn off that the fish might die, but as it refused to do so it was killed by having its throat cut. It may be remarked here that two or three gars were kept for a week in sea water of a density of about 1.023 without any apparent discomfort, in fact they seemed as much at home in this as in fresh water.

The following measurements were made of the large fish above referred to:

Length over all	44½ inches
Head to hinder edge of opercle	14 inches
Upper edge of caudal fin	4 inches
Lower edge of caudal fin	6 inches
Right lobe of testis	8 inches
Left lobe of testis	11 inches
Length of mouth	7½ inches
Vertical gape of mouth	5¼ inches
Diameter of orbit of eye	⅞ inch
Circumference of snout at end of lower jaw	1¾ inches
Snout at angle of jaw	6¼ inches
Head around eyes	8¼ inches
Head at hinder edge of opercle	10¼ inches
Body at front of pelvic fins	14 inches
Tail at front of base of caudal	6 inches
Spread of pectorals	9 inches

***Anguilla chrisypa* Rafinesque. (?)**

FRESH-WATER EEL.

On June 15, 1911, while fishing with a dip net in a small brook at the Hammocks on the eastern side of Beaufort, 2 little eels were taken which at first were thought to be young *Amphiumas*. One got away but the other was safely brought to the laboratory where it was kept until it caused its own death by climbing over the edge of the aquarium. It was very long in the tail region, *i. e.* back of the anus. Its body was semi-transparent, so that when looked at from above its blood-red gills showed up prominently, and in lateral view not only these but the viscera could be seen. It was impossible on account of its very small size to count the fin rays, hence the doubt about its identification.

Bascanichthys scuticaris (Goode and Bean).

BLACK-SNAKE EEL.

In 1906, on July 31, Dr. H. E. Enders dug up, in a sandy shoal south-west from the laboratory and distant some 300 yards, a specimen of the black-snake eel, the first ever taken in the waters of North Carolina.

On July 10, 1911, one of the assistants dug up on the same shoal another but smaller specimen. Enders' specimen was brought in uninjured and kept for nearly three weeks before it finally died. The second specimen was cut nearly in two by the spade used in digging.

Enders' specimen was 89.2 cm. long, of which length the dorsal fin covered 86.5 cm., while the anal was 39 cm. long. The 1911 specimen was 40.3 cm. long over all. The dorsal was 38.5 cm. and the anal 17.5 cm. in length. The head from the tip of the snout to the hinder edge of the gill slits measured 2.2 cm., while the distance from the snout to the eye was .3 cm. The skin over the head was plaited in numerous very small longitudinal folds. The color above was greenish olive, below cream white.

Coles (1910) took a small specimen in a dip net at Cape Lookout in 1909. It was drifting near his boat when a small school of frigate mackerel came swimming by. Several of these snapped at the eel and mutilated its tail. The specimen is now in the museum at Beaufort.

Brevoortia tyrannus (Latrobe).

MENHADEN.

This fish was very scarce from May 25-July 31, 1910. During the latter part of May and the first of June a few small catches were made. On July 19 the wind changed from S. W. to W., N. W., N. and N. E. The latter wind brought a few schools of "fat-backs" into the harbor, the first one noticed being near the laboratory island on the afternoon of that day. Two days later one boat got a small load inside the harbor. Toward the close of September the fish reappeared in large numbers, and the most enormous catches in the history of Beaufort were made. The failure of this fishery during the early part of the season brought great hardship to the fishermen and to those who had invested in boats and gear for this work. In 1911 the fish, though not so scarce as in 1910, was by no means abundant in June and July.

Synodus foetens (Linnaeus).

LIZARD-FISH.

The lizard-fish is abundant in Beaufort Harbor, but rarely measures more than 8 or 10 inches. One, taken by some fishermen at the corner of Bird Shoal, near the inner beacon, on June 28, 1911, measured $13\frac{1}{4}$ inches over all. It is reported that specimens 2 feet long have been taken, but this is the largest which the writer has seen.

Coles (1910) reports these fish as fairly common at Cape Lookout, where they seem to be solitary in habit and are given to lying motionless in eel-grass, alongside a piece of timber, or half-buried in sand. He finds that they are voracious biters at the hook.

Tylosurus marinus (Walbaum).

GREEN GAR.

Tylosurus acus (Lacepede).

GAR-FISH.

On July 2, 1910, there was captured near the inner beacon in Beaufort Harbor a *Tylosurus marinus* 21½ inches long. Smith notes that the maximum size is about 4 feet, the average 1½ to 2 feet. On July 6 at the same place there was taken a *Tylosurus acus* 33 inches long. This was a female with an abdomen but 13½ inches long, through which stretched the alimentary canal, straight from mouth to anus. One horn of the ovary was rudimentary, measuring but ½ to ¾ inch, the other however was 9 inches long. The liver likewise had but one lobe. The air bladder was greatly dilated and was seemingly divided into compartments.

It is interesting to find that Sir Hans Sloane, as early as 1725, in describing the green gar-fish or needle-fish of Jamaica, *Acus vulgaris*, noted that "Its Stomach was in no ways to be distinguished from the Aesophagus or Guts, all three being one straight equally large tube from the Mouth to the Anus."

Mugil cephalus Linnaeus.

JUMPING MULLET.

The mullet is one of the most abundant and valuable fishes found at Beaufort. It is known to reach a length of 22 inches, but the 2 largest collected by the writer in 1911 were 13 inches long. One of these justified its name by jumping out of the bunt of the seine into the boat. Coles reports similar occurrences and says that once he received so hard a blow from one that he thought that his boatman had struck him with an oar.

Scomberomorus maculatus (Mitchill).

SPANISH MACKEREL.

Two fairly large Spanish mackerel were taken in the harbor in 1910, one of 2 pounds, the other of 3½ pounds weight and 25 inches long. Specimens taken outside the harbor frequently ran to 9 or 10 pounds, while the maximum recorded for the Atlantic Coast, according to Dr. Smith (1907), is 41 inches long and 25 pounds weight. To illustrate the abundance of this elegant fish on our coast, it may be added that on October 17, 1910, Capt. J. H. Potter of Beaufort bought 3453 pounds of mackerel, which at 15 cents per pound amounted to \$518. This catch was made at Cape Lookout by one crew of fishermen.

Trichiurus lepturus Linnaeus.

SCABBARD-FISH

During the summer of 1910 the writer again took at different times specimens of the scabbard-fish, *Trichiurus lepturus*, and at the same hauling ground as heretofore, viz., near the beacon opposite the mouth of Core Creek, about halfway between the laboratory and the Narrows of Newport River. The female was 27½ inches long and her ovary was filled

with small eggs nearly ripe. The male lacked but 2 inches of being 3 feet long. Pressure readily brought the milky milt and under the microscope the sperms, which were active, were found to have a large head and middle piece and a long fine tail. The abdomen in this specimen measured 8 inches from the heart to the anus, of which space the enormously developed testis filled $7\frac{1}{4}$ inches.

Coles reports this fish as being very plentiful at Cape Lookout in 1909 and 1910, but that he saw none in 1911. In 1909 he took 50 at one haul. The writer recalls that on going to help fish the laboratory pound net one morning 5 or 6 years ago, the lead was found to have a dozen or more scabbard-fish meshed in it. It is far from uncommon at Beaufort in July and August.

***Seriola zonata* (Mitchill).**

***Seriola carolinensis* (Hollbrook).**

RUDDER-FISH.

Of the rudder-fish, *Seriola zonata*, Smith (1907) says, in reference to its seeming infrequent occurrence,—“it will doubtless be found well represented on the North Carolina coast when properly sought.” Until the present season (1911), the only specimen possessed by the laboratory was one measuring $3\frac{7}{8}$ inches long. This was taken, June 18, 1904, in a trap under the laboratory wharf. The yellow bands so prominent in the living or newly dead fish have become dark and greatly faded through the action of the preserving fluid.

Of the closely allied form, *Seriola carolinensis*, Smith writes: “This species is closely related to *Seriola zonata* and has been regarded by recent writers as a variety of that species.” As to its occurrence, it has been recorded from Beaufort by various authors, but Dr. Smith notes that it is far from common. The laboratory records give us the information that in 1902 the “Fishhawk” took one specimen, while in 1905 Capt. J. H. Potter sent a specimen to the museum. In 1910 Coles took at Cape Lookout a considerable number of *S. zonata* of various sizes, thus verifying Smith’s prediction.

During the season of 1911 the laboratory pound net took several small *Seriola*, which were identified as *S. zonata*, and a larger one, classified as *S. carolinensis*, $10\frac{1}{2}$ inches long to the root of the caudal fin, 13 inches over all, with a depth of 3 inches (the head alone was 3 inches long). The dorsal rays were V+I+35, the anal I+19, while the bands were very marked. On June 16 two sportsmen fell in with a school off the Shackleford jetties and caught a score. Later in the season large numbers were taken by fishermen—the writer saw at one time on the floor of Capt. Potter’s fish house some 300 or 400 pounds. The local name of this fish is “bream.”

One of the young ones taken in the pound net was put in a large tank of running salt-water, and soon became the pet of the laboratory. At first the little fish, which was appropriately dubbed “Stripes,” kept to itself, lying close against or swimming slowly around one of the legs of a wooden aquarium stand. Later, however, it became very friendly with

three 12-inch salt-water catfish, *Galeichthys milberti*, which were kept in the same tank. These stayed for the most part under a low lying wooden stand which completely hid them from view. Here the little rudder-fish took up its abode, coming out to feed or to take a turn around the tank. Whenever the catfish swam around, the little fish swam just over one of them in the pectoral or hinder dorsal region, seeming almost to rest on the catfish's back with its outspread pectorals. It did the same with a small green turtle. It was noticeable that if by any chance the little rudder-fish became separated from its siluroid companions, it swam about in all directions in almost a panic until it found them. When chopped bits of fish were thrown into the tank, the catfish never presumed to feed until their more sprightly companion had satisfied its appetite. All its actions gave the distinct impression of alertness and inquisitiveness. The writer has perhaps never had a more charming aquarium pet.

Selene vomer (Linnaeus).

MOON-FISH. LOOKDOWN.

It is a fact well known to all ichthyologists that the young of many fishes differ markedly from the adults. This is especially true of the moon-fish or lookdown. Of Beaufort specimens Smith (1907) says: "The young differs greatly from the adult in appearance, the body being much deeper, the profile less vertical, the ventral fins much longer, and the dorsal rays more produced. An example in the Beaufort Laboratory 1.25 inches long taken in the summer of 1900 has the ventral fins 1 inch long and the anterior dorsal rays 2.37 inches long."

On June 7, 1911, the writer took a specimen which measured in length 2 inches, in depth $1\frac{1}{2}$, and which had anterior dorsal rays extending backward $3\frac{3}{4}$ inches. The body was faintly banded, the ventral fins were very long, as long as the anterior rays of the anal, and the chin region and breast parts met at an angle which lacked but little of making 70° . The bands, the exaggerated dorsal filaments, and the elongated ventrals made it look like the thread-fish, *Alectis ciliaris*; but the almost vertical forehead and a count of the fin rays forbade such identification. Finally by a process of elimination it was identified as *Selene vomer*. A greater difference between young and adult has never been met with among fishes by the writer.

Pomatomus saltatrix (Linnaeus).

BLUE-FISH.

One of the most toothsome of Beaufort fishes is the blue-fish, *Pomatomus saltatrix*. While caught in large numbers and of considerable size outside, those caught inside are of smaller size and are in fewer numbers. The laboratory seining crew took one in West Bay in Harker's Island on June 30, 1911, which was 21 inches long over all and $4\frac{1}{4}$ inches deep (body only). According to Smith the largest blue-fish ever recorded from the Atlantic coast was 3 feet 9 inches long and weighed 27 pounds. It was taken near Nantucket in 1903.

Coryphaena hippurus Linnaeus.

DOLPHIN.

The dolphin is such an infrequent visitor at Beaufort that the capture of a specimen is something of an event. According to Smith (1907) 4 specimens have been taken in the Beaufort region. For but one of these do we have definite data. On August 1, 1902, Mr. Charles S. Wallace, a fish-dealer of Morehead City, sent to the laboratory a fine specimen. It measured 28.5 inches from end of snout to tip of tail and had 56 dorsal and 27 anal fin rays. Its forehead was of the abrupt type common to its kind.

On June 7, 1911, Capt. J. H. Potter, a fish-dealer of Beaufort, presented to the laboratory a fine young specimen which had been taken at Cape Lookout. It measured 16 inches to the base of the caudal fin and 19 over all, and its depth was $3\frac{1}{4}$ inches. Its dorsal fin had 60 and its anal 27 rays. The profile of its head was not of the typically vertical shape but more pointed, in this respect agreeing with the small dolphin, *Coryphaena equisetis*, from which, however, it was excluded by the number of the fin rays. It was plainly a young *hippurus*, the adult of which is known to reach a length of 6 feet.

Coles reports that he has taken the dolphin by trolling in the breakers at Cape Lookout. Twice he has eaten of this fish and found it fairly good. His fishermen, however, refused to touch it, declaring that it was poisonous.

Lobotes surinamensis (Bloch).

TRIPLE-TAIL.

In "Notes for 1909" the writer recorded the length of some large triple-tails or flashers as $18\frac{1}{2}$, 21, 23, 25, and 25 inches. Unfortunately there was no means at hand for weighing these specimens.

In 1910 the conditions were reversed, the two fine specimens caught being weighed but not measured.* One tipped the beam at 12 pounds, the other at $17\frac{1}{2}$. The largest hitherto recorded for Beaufort weighed 11 pounds. The writer had no idea of the power of these fish until he attempted to catch and lift into the boat the larger of the above specimens. It not only spined him and broke away but deluged everybody in its flurries.

Coles relates that in 1909 he captured at Cape Lookout a "steamboat" (so called from its splashing habits when taken in a net) which weighed 26 pounds. However, large and powerful as were these fish, especially the last, they do not measure up to those found in the East Indies. Tension-Woods (1888) captured on the north coast of Borneo a specimen nearly three feet long.

Archosargus probatocephalus (Walbaum).

SHEEPSHEAD.

On June 20, 1911, some fishermen on the outer side of Bird Shoal took a large specimen of this fish. It measured from tip of snout to tip

* These fish were taken by Capt. J. E. Lewis, of Morehead City, to whom the writer is indebted for many other interesting specimens.

of tail $17\frac{1}{4}$ inches, and in depth (body only) $6\frac{1}{4}$ inches. Unfortunately the writer had no means at hand for weighing this, the largest sheepshead he has ever seen.

***Diplodus holbrookii* (Bean).**

SPOTTED-TAILED PIN-FISH.

Jordan and Gilbert reported this fish as very abundant in Beaufort waters in 1879, but not until the writer had hauled for several summers on the edges of the shoals with a small-meshed seine did he take any, and when caught they were thought to be new to Beaufort. During the summer of 1911 large schools of young were seen playing around the jetties on the inside of Shackelford Banks. In the clear water the spot at the bases of their caudal fins could be easily seen.

During various years since 1900, but always in July, Coles has taken the adult fish in great numbers at the "Rocks," about 2 miles out from New River Inlet. These were 12-13 inches in length and averaged about $1\frac{1}{2}$ pounds in weight. He has often taken the young but never any adults at Cape Lookout. From this it would seem that New River Inlet is about the northern limit of adults.

***Cynoscion regalis* (Bloch and Schneider).**

GRAY TROUT.

The largest gray trout, which the writer took during the summer of 1910 measured $18\frac{1}{2}$ inches in length and weighed a full two pounds. However, toward the close of July, some menhaden fishermen made a catch of "fatbacks" near the railroad bridge at Beaufort, and got a number of trout running in weight from $2\frac{1}{2}$ to 7 pounds. These of course were "outside" fish which had come in with the menhaden to feed on them.

According to Smith (1907), the average weight for this fish is about 2 pounds, though they frequently run 5 to 6 pounds, occasionally to twice as much, while the maximum recorded is 40 pounds.

***Micropogon undulatus* (Linnaeus).**

CROAKER.

In all his seining around Beaufort the writer has never caught so many croakers, and these of such large size, as during 1910. In one haul at the Narrows, nearly a boat load of fish ranging from 9-12 inches were caught. Even the experienced fishermen expressed their surprise at both their size and abundance. The largest taken during this season were $14\frac{3}{4}$ and $15\frac{1}{2}$ inches long. The latter weighed $1\frac{1}{2}$ pounds. The largest taken in 1911 measured $12\frac{1}{2}$ and 13 inches respectively.

***Sciaenops ocellatus* (Linnaeus).**

RED DRUM.

During the summer of 1911 the writer collected 3 young red drum which were among the most beautiful fish he has ever seen at Beaufort. The first, taken June 23, in West Bay of Harker's Island opening on the

“Straits,” was 17 inches long. After death the tip of the caudal became a fine cobalt blue working up toward purple as time passed. On the following day two others were taken in North River. One, measuring $17\frac{1}{2}$ inches over all, had the black spots at the root of the tail as shown by Smith (1907) in plate 19, but lacked the lateral one. The other measured 25 inches and had 2 spots at the root of the caudal, but the lateral marking was on the right side just below and behind the junction of the spinous and soft parts of the dorsal.

Menticirrhus americanus (Linnaeus).

SEA MULLET.

The largest sea mullet, taken by the laboratory crew in 1910, measured $15\frac{3}{4}$ inches in length and weighed 2 pounds. These fish occasionally run to 3 pounds in weight but such specimens are rare. On June 20, 1911, Capt. Lewis took in Newport River two measuring $15\frac{1}{2}$ inches each.

Pogonias chromis (Linnaeus).

SEA DRUM; BLACK DRUM.

Capt. Oscar Noe, superintendent of a menhaden fish factory at Beaufort, reports that about May 10, 1911, a menhaden boat in making a catch of that fish outside, took and brought in a great school of sea drum. These equalled 50,000 menhaden measure, *i. e.*, filled a great bin to the point that 50,000 menhaden would have done. Schools of these drum are often a great nuisance to the menhaden fishermen.

Ceratacanthus schoepfii (Walbaum).

FILE-FISH; FOOL-FISH.

On June 9, 1910, there was taken near the upper beacon in Newport River a large file-fish. Its length all over was 18 inches, the depth was $6\frac{7}{8}$ inches, the greatest thickness $1\frac{1}{2}$ inches, and its weight $1\frac{1}{2}$ pounds. The ground color of this fish was a dirty cream and this was flecked over the whole body with bright orange. The anus measured $\frac{1}{3}$ of an inch, a long narrow slit with its edges closely beset with granulations. A long bone extended on the ventral side from the throat region clear back to the middle of the belly. Under the forward end of this bone and between the bases of the pectoral arches, and completely separated from the belly cavity by these bones lay the heart in close juxtaposition to the gills. This heart was curiously elongated, measuring about one inch in length.

On June 9, 1911, another large specimen of this fish was taken in the laboratory pound net. Its extreme length was $17\frac{1}{4}$ inches, depth $6\frac{1}{4}$ inches; its dorsal spine was $2\frac{1}{2}$ inches long, and the diameter of its eye $\frac{3}{4}$ of an inch. Its general color was a bright orange yellow, while in the dorsal region it was a dirty brownish black.

Smith assigns 2 feet as the maximum size of this fish, but these two are the largest the writer has seen. The second one unfortunately could not be dissected.

Leptecheneis naucrates (Linnaeus).

SHARK'S PILOT; REMORA.

Early in August, 1909, Coles brought in from Cape Lookout a *Leptecheneis naucrates* of large size. After being in weak formalin for a year, it measured 32 inches long over all. The sucker, which was $6\frac{3}{4}$ inches long and $2\frac{3}{8}$ inches wide (outside measurements), had 22 valves. During the summer of 1910 Coles captured another fish of about the same size at the Cape. He says that specimens of this size are by no means rare there. This is undoubtedly due to the large number of great sharks, huge rays and giant turtles, their hosts.

On July 13, 1910, a 14-inch specimen of this fish was taken off the laboratory wharf with hook and line. This is the first instance known to the writer of this fish being caught in this manner, though Smith in his *Fishes of North Carolina* says that such captures are sometimes made and Coles affirms that they bite vigorously at the hook and give good sport. This specimen had 18 laminae in its sucker. Smith (1907) says the number varies from 20 to 28 for this fish and that Beaufort specimens generally have 23 laminae.

The writer took on a shark hook off the laboratory wharf at Beaufort in the summer of 1902, a 6-foot sharp-nosed shark (species undetermined) which had attached to it a remora 12 or 15 inches long. This sucker-fish was greatly disturbed as the shark was drawn up on the wharf. Whenever that part of its friend's body to which it was attached was drawn up out of the water, it would drop down into the water, dash wildly about, and then reattach itself lower down to again go through the same performance. An attempt was made to catch it with a dip net but it was too agile to permit this. When the shark was finally drawn up on the wharf, the remora disappeared into the deeper water.

Lophius piscatorius Linnaeus.

GOOSE-FISH; ANGLER.

During the winter of 1909 a fisherman found and brought to the laboratory a large *Lophius piscatorius* which had drifted on one of the marshes. Director Aller, not having any receptacle large enough to hold it, preserved only the head. Measured in a straight line from the tip of the lower jaw to a line joining the anterior edges of the bases of the pectorals, its length was $14\frac{1}{2}$ inches, and its greatest width was 18 inches. The gape of the mouth from right to left was $12\frac{1}{2}$ inches; the vertical gape, because of the bad condition of the head, could not be determined with any accuracy. The width (inside) between the eyes was $4\frac{1}{2}$ inches. Both jaws were studded with sharp thorn-like teeth, the longest measuring $\frac{7}{8}$ of an inch as it stood fixed in the jaw. The two spines on the head had lost their covering of flesh and skin. The shorter was $3\frac{3}{4}$ inches, the longer $5\frac{7}{8}$ inches in length. The fore and aft measurement of the pectoral was $9\frac{1}{2}$ inches, and its length from the body out was $6\frac{3}{4}$ inches. The goose-fish, locally called "all-mouth toad," is rarely found in Beaufort harbor, more frequently coming ashore at Cape Lookout.

Pterophryne histrio (Linnaeus).

SARGASSUM-FISH.

But little more abundant than the angler is its diminutive relative the sargassum-fish, which comes into Beaufort harbor anchored in the drifting seaweed of the same name. Sharp lookout was kept for this fish all summer (1910), but, despite the strong southern winds, no weed came in and the search was futile. This fish, like the angler, lays a long gelatinous egg raft in which the ova are imbedded. This was first noted by Smith (1898) at the Woods Hole laboratory, and later corroborated by Gudger (1905) at the Beaufort station.

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